An Empirical Analysis of R&D Competition in the Chemicals Industry.

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This paper evaluates the equilibrium effects of the Research and Experimentation Tax Credit on the Chemicals Industry taking into consideration firm interactions. The tax credit was put into place to counteract the underinvestment in private R&D caused by firms not internalizing the benefits of technological spillovers from their research. However, this rationale ignored the impact of product market competition.

I propose and estimate a structural dynamic oligopoly model of competition in intellectual assets to capture the impact of interactions between firms in the industry. I estimate the dynamic parameters of the model using methods from Bajari, Benkard, and Levin (2007). I build upon previous estimators by incorporating unobserved firm-level heterogeneity using techniques from Arcidiacono and Miller (2008). I use publicly available panel data on firms' R&D expenditures and their patenting activities to measure innovations. In the data, I observe firms that persistently invest more in research and generate more innovations than other firms that are observationally similar. I model this heterogeneity as an unobserved state that raises a firm's research productivity.

I find that increased investment in R&D by more advanced firms due to the subsidy, was largely offset by decreases by smaller firms because of the substitutability of knowledge in product market. This greatly reduced the effectiveness of the policy to spur innovation and limited its impact on social welfare.

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